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LISTING OF CLAIMS

1 (currently amended). In apparatus for detecting the presence of an airborne chemical or biological analyte, the improvement comprising:

a gas- and liquid-containing chamber;

means for introducing an analyte-free collection liquid into said chamber;

means for rapidly sampling a volume of ambient air and transferring said analyte therefrom into said collection liquid, said sampling means comprising an air intake means and and an air venting means; and

means for removing from said chamber an analyte-enriched collection liquid;

wherein said volume of air passes through a preferably horizontal air inlet and ~~upwardly~~ thence through a preferably vertical electrically conductive collector electrode tube with means for applying an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field.

2 (currently amended). The apparatus of claim 1, comprising means for introducing a fine mist of droplets into ~~the air-stream passing through~~ said collector tube so as to cause wetting of the inner surface of said tube by a liquid film.

3 (previously presented). The apparatus of claim 2, wherein said mist is generated by an ultrasonic humidifier.

4 (previously presented). The apparatus of claim 2, comprising means for generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film.

5 (currently amended). In a method for detecting the presence of an airborne chemical or biological analyte, the improvement comprising the steps of:

providing a gas- and liquid-containing means;

introducing an analyte-free collection liquid into said ~~container~~ containing means;

rapidly sampling a volume of ambient air and transferring said analyte therefrom into said collection liquid, said sampling means comprising an air intake means and an air venting means; ~~and~~

removing from said containing means an analyte-enriched collection liquid;

passing said volume of air through a preferably horizontal air inlet and ~~upwardly~~ thence through a preferably vertical collector electrode tube; and

applying an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field.

6 (previously presented). The method of claim 5, comprising the step of introducing a fine mist of droplets into the air stream passing through said collector tube so as to cause wetting of the inner surface of said tube by a liquid film.

7 (previously presented). The improvement of claim 6, wherein said mist is generated ultrasonically.

8 (previously presented). The improvement of claim 6, comprising the step of generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film.

9 (currently amended). The apparatus of claim 1, wherein said collector electrode is ~~a metallic~~ tube-shaped with its inner surface electrically conducting.

10 (currently amended). The apparatus of claim 1, wherein said collector electrode is a metal or other electrically conductive material or comprises an electrically conductive coating or foil applied to the inner surface of a non-conductive tube.

11 (previously presented). The apparatus of claim 9, wherein said collector electrode has a roughened preferably sandblasted inner surface.

12 (currently amended). A method of capturing aerosolized ~~sub-micron-size~~ particles as small as 0.01 micron in size from a volume of air which comprises passing said air through an electrostatic precipitation-based aerosol collector.

13 (currently amended). The method of claim 12, wherein said ~~sub-micron-size~~ particles are virus particles.

14 (currently amended). The method of claim 12, wherein said ~~sub-micron-size~~ particles are toxin particles.

15 (new). The apparatus of claim 1, wherein said collector electrode is tube-shaped with its inner surface electrically conducting, said central wire-or rod-shaped discharge electrode is kept at a high negative or positive potential [possibly of as much 10 KV or higher], and said horizontal tubular air intake permits air to enter unimpeded at a high flow rate with a minimal pressure drop.

16 (new). The apparatus of claim 2, wherein said liquid film is at least 25 microns thick, so as to minimize collection losses due to captured particles adhering too firmly to the collector electrode.

17 (new). The apparatus of claim 16, wherein said liquid film is formed by dripping liquid from the top down a roughened, preferably sandblasted, metal surface and/or by liquid droplets that are carried by the sampled air.

18 (new). The apparatus of claim 16, wherein the thickness of said liquid film is fine-tuned by adjustments of the power of the exhaust air blower and of the inter-electrode voltage and electric field distribution such as to assure that the introduced mist results in proper wetting of the collector electrode without causing unwanted spark discharges.

19 (new). The apparatus of claim 1, wherein the electrodes and applied voltage are so designed and adjusted as to generate a sufficient corona to ionize most of the particles in the air stream and a sufficient electric field to deposit most of these particles at the collector electrode, and wherein the length and diameter of said collector electrode are such as to allow an adequate residence time for most particles to reach it rather than be carried away with the air stream.

20 (new). The apparatus of claim 4, comprising means for operating the system in alternating dry and wet modes so as to cut down on evaporation losses during operation in the dry mode and thus reduce the water replenishment requirements and to also limit the occurrence of any power losses due to spark discharges to relatively brief wet wash-down periods.